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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,259	02/07/2001	Cristobal Guillermo dos Remedios	13388	4496

7590 04/24/2006

Scully, Scott, Murphy & Presser  
400 Garden City Plaza  
Garden City, NY 11530

EXAMINER
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CHEU, CHANGHWA J

ART UNIT	PAPER NUMBER
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1641

DATE MAILED: 04/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/778,259

Applicant(s)

REMEDIOS ET AL.

Examiner

Jacob Cheu

Art Unit

1641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 38 and 42-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 38 and 42-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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### DETAILED ACTION

Applicant's amendment filed on 1/30/2006 has been received and entered into record and considered.

The following information provided in the amendment affects the instant application:

1. Claim 1-37, 39-41 are cancelled.
2. Claim 38, 42-45 are under examination.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claim 38, 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (J. Inorganic Biochemistry 1998 Vol. 71, page 1-6) in view of Pisanti et al. (Marine Pollution Bull (1988) Vol. 19, page 328-333).

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Liu et al. teach a method of measuring fluorescence quenching of DNA bound fluorescence dye, e.g. increase dissociation or inhibition of fluorescent dye bound to the DNA, by a sample containing a metal atom, i.e. copper (II) (See abstract). Liu et al. teach that the presence of copper (II) metal would compete with binding the DNA molecule intercalated with the fluorescence ethidium dye (See abstract; Results and Discussion). The binding constant of the copper is around  $10^{-10}$  ( $M^{-1}$ ) which falls within the range of micromolar (See Figure 1). However, Liu et al. do not explicitly teach detecting the inhibition or dissociation of the dye on the DNA as an indication of the presence of a metal.

Pisanti et al. teach the presence of metals in the ecosystem, e.g. ocean or rivers, is of great concern because of the potential to impact the quality and physiology of marine organisms (page 328, left column, first paragraph; page 330, right column, last paragraph). Pisanti et al. teach metal levels, such as copper, are essential for the biological equilibrium of the marine ecosystem. Supra.

Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to have motivated Liu et al. to measure the presence of copper in an aquatic sample as taught by Pisanti et al. because Liu et al. has developed an effective fluorescence quenching assay for the heavy metal, and monitoring metals in the environmental is of great concern for maintaining quality of ecosystem.

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With respect to claim 43, Liu et al. use ethidium bromide as the fluorescence dye (See page 2, Section 2.1 Materials and Methods).

4. Claim 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. in view of Pisanti et al. and further in view of Gold et al. (US 624246).

Both Liu et al. and Pisanti et al. references have been discussed but are silent in teaching use of a solid support for immobilization of DNA for analysis.

Gold et al. teach an efficient and sensitive screening for DNA binding agents by immobilizing DNA on solid support and measuring the change of dye, e.g. fluorescence, for indicative of the presence of the binding agent (Col. 13, line 25-345; Figure 4-5). Gold et al. teach a variety of choices for solid support, including glass, polystyrene, gold or silicon (Col. 6, line 42-50).

Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to have provided both Liu and Pisanti et al. with the solid support for immobilization of DNA for better efficiency since it is well-known for immobilization of molecule on a solid support to increase sensitivity of the assay and the methodology employed by Gold et al. in also in an analogous field, e.g. measuring change of fluorescence dye for indicative of DNA binding agents.

#### ***Response to Applicant's Arguments***

5. Applicant's arguments with respect to claims 38, 42-45 have been considered but are moot in view of the new ground(s) of rejection.

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### Conclusion

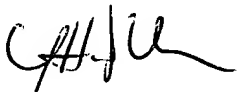
6. No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Cheu whose telephone number is 571-272-0814. The examiner can normally be reached on 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jacob Cheu  
Examiner  
Art Unit 1641



April 3, 2006



LONG V. LE  
SUPERVISORY PATENT EXAMINER  
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04/03/06